

Foundation of the Digital Global Economy

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ABSTRACT

A medium to facilitate the exchange of value has been the sole necessity for the mere existence of currency. As the civilization moved from using metals, paper, and plastic to facilitate exchange, our requirements from a currency became refined. Some of those requirements were the prevention of counterfeiting and accountability. As the human civilization moves forward, the solution to some of the problems faced by us are discovered by humans. Cryptocurrency is a decentralized form of currency mined by computers by solving complex equations in exchange for a reward of the very same commodity. This article aims to study the major cryptocurrencies and the concept of blockchain, how they operate, how it will be affecting India, and what are the consequences of banning this form of currency. This research is carried out by evaluating white papers of Bitcoin and Ethereum (the two main cryptocurrencies of present time) along with research papers and news articles found with the help of search engines and online discussion threads.

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1. INTRODUCTION

The difference between money and currency is merely a tangibility. The money is an intangible concept, while currency until now has been used to describe the notes or coins issued by the governments. The difference between these two words stands crystal clear with the advent of cryptocurrency being adopted across the world. This intangible form of currency is mined by computers through solving complex mathematical problems. The Bitcoin, for example, holds value simply because of its scarcity. In case of cryptocurrency, a government is not required to instruct the citizens about what holds value and what does not; community choice prevails. As of now, a community choice is observed thriving in terms of cryptocurrency. It can be examined how cryptocurrency operates. What are its limitations? How shall it provide a reliable and robust mechanism best suited for the economic needs of modern civilization? A special emphasis shall be on blockchain technology, which serves as the foundation of the technology. Here is an in-depth study of cryptocurrency's potential and problems it would help to solve. How does Indian government look at it? Whether Indian government will ban it; and, if it is banned, what are the consequences of banning cryptocurrency?

The purpose of this article is to establish an understanding of blockchain technology and how it has been used to establish two major cryptocurrencies of present time: Bitcoin¹ and Ethereum². The implications of blockchain technology are the prevention of financial de-platforming³ as well as de-platforming of social media, which are some of the advantages of blockchain technology. Here, this article looks into India's stand on cryptocurrency and its implications as well as drawbacks of banning cryptocurrency.

The scientific basis of this article can be explained in accordance with the purpose of the study as follows. Blockchain works as blocks of data arranged systematically in a chronological order. This chain of data is replicated by mining servers working as nodes on the network replicating and verifying transactions/events in a ledger accessible to everyone. The nodes can verify transactions by showing proof of work i.e., solving complex hashing algorithms; therefore, putting their computing power on stake. The former is the basic working of the Bitcoin blockchain as well as the native Ethereum blockchain. Blockchain platforms not only provide the technology to run peer-to-peer currencies, but also provide the possibility of building social media platforms completely independent and free of any intervention from major technological corporations.

2. METHODOLOGY

In the present article, secondary data were collected from well-known cryptocurrency platforms, for example, Binance. The research was conducted with the help of white papers, research papers and new articles found with the help of search engine and online discussion threads to look into the current scenario of cryptocurrency and blockchain technology.

3. CRYPTOCURRENCY

Individual coin ownership records are kept in a ledger that exists in the form of a computerized database employing strong encryption to protect transaction records. This regulates the production of new currencies and validates ownership transfers. It is usually not supplied by a centralized authority and does not exist in a physical form (like paper money). Cryptocurrencies, in contrast to centralized digital currencies and central banking institutions, are often decentralized. If a cryptocurrency is coined or manufactured prior to release, or if it is issued by a single issuer, it is classified as centralized. Each decentralized cryptocurrency makes use of distributed ledger technology, most often a blockchain, to function as a public financial transaction database. Bitcoin was the first decentralized cryptocurrency

¹ Bitcoin, launched in 2009 is a decentralized blockchain platform meant to facilitate the exchange of value. The first successful implementation of a cryptocurrency.

² Ethereum, launched in July 2015, is a decentralized platform that runs so-called "smart contracts". Smart contracts are "self-executing" contracts or applications that run exactly as programmed without any possibility of downtime (i.e., the blockchain is never down, it is always running), censorship, fraud or third-party interference.

³ Deplatforming is the act of boycotting an individual or a group of individuals from availing the services of a platform (In this case financial and social media) by denying access to the said platform.

launched in 2009 as open-source software. Following Bitcoin's debut, several cryptocurrencies have surged in value.

4. BITCOIN

Bitcoin is a decentralized digital currency which can be sent directly from one user to another over its peer-to-peer network. There is no single administrator or central bank. Cryptography is used by network nodes to verify transactions, which are then recorded in a blockchain, which is a distributed ledger that is not centralized. As a result of this mining process, Bitcoins are created. According to a research performed by the University of Cambridge, the most popular cryptocurrency is Bitcoin (Houben, 2015). In 2017, there were 2.9 to 5.8 million unique users of cryptocurrency wallets (Bryans, 2014). It was founded in 2008 by an unknown person or group of individuals under the pseudonym Satoshi Nakamoto. It was implemented in 2009 when the currency's implementation was released as open-source software (Bryans, 2014).

Nakamoto (2008) proposed an electronic commerce system that is not dependent on trust. He began with the traditional technique of digital signature coins, which allows for enough ownership control but does not prevent duplicate spending. To address this, he suggested a proof-of-work peer-to-peer network that keeps a public history of transactions that becomes computationally impossible to alter when nodes control the majority of the CPU power. Due to its unstructured simplicity, the network is stable. The nodes work in unison, with very little coordination. Since messages are not directed to a specific destination and must be delivered quickly, they are not needed to be tagged. Nodes may leave and rejoin the network at any time, with the proof-of-work chain proving what happened while they were gone. They function by extending valid blocks while refusing to deal with incorrect blocks. This consensus method may be used to create any necessary rules and incentives.

Almost all online commerce today relies on banking institutions to handle electronic payments as trusted third parties. While the framework is adequate for the majority of transactions, it is vulnerable to the trust-based paradigm's basic flaws. Fully irreversible transactions are impractical due to financial institutions' inability to resolve disputes. Mediation costs raise transaction costs by reducing the minimum transaction size and eliminating the possibility of small informal transactions, as well as a wider cost connected with the inability to make irreversible payments for irreversible services. As the likelihood of a reversal grows, so does the need for confidence. Customers should be cautious of merchants that badger them for information they do not need. Fraud is generally seen as an unavoidable part of life. While these costs and risks of payment may be avoided in person by using real money, payments cannot be made without the help of a trustworthy partner via a communication channel.

5. ETHEREUM

Ethereum, or Ether, is a self-regulating platform (Houben, 2015) that enables payments to occur only when all agreed-upon criteria have been met. The platform is programmed in such a manner that payment is made only when the job is completed in accordance with the criteria of the encrypted coded contract (virtual contract). The transaction is not involving a third party. It allows the development and operation of Smart Contracts and Distributed Applications (D Apps) without the need for downtime, fraud, control, or intervention from a third party.

Ethereum is capable of "codifying, decentralizing, securing, and trading almost anything". One of the most significant Ethereum-related initiatives is Microsoft's collaboration with ConsenSys, which provides "Ethereum Blockchain as a Service (E BaaS) on Microsoft Azure, providing enterprise customers and developers with a single-click cloud-based blockchain development environment".

After a fraudulent attacker stole more than \$50 million in assets from the decentralized autonomous organizations (DAO) (Houben, 2015), a collection of smart contracts built from Ethereum's computing platform, Ethereum was split into two separate blockchains in 2016: Ethereum and Ethereum Classic. Ethereum's current version was created as a hard fork from the original software in order to prevent further ransomware attacks. Ethereum is the second-largest virtual currency in the market in terms of market value in September 2019, behind only Bitcoin (Hileman & Rauchs, 2017). Ether money is much simpler to acquire than Bitcoin (roughly 14 or 15 seconds compared to Bitcoin's near-uniform 10 minutes), and there are significantly more ether units in circulation than Bitcoin.

6. BLOCKCHAIN

A blockchain is a database that is built over time by a network of users who all use the same software and are bound and controlled by the program's limitations and regulations. A blockchain is made up of data blocks that are eventually "chained" together, as the name suggests. It is more like a spreadsheet that grows as more cells are added. The program builds and maintains a blockchain database while it is in use. As a result, unlike a centralized database controlled by a single entity, it remains "alive" even if individual members stop contributing (or, for example, go bankrupt). It produces an irreversible record that is unaffected by third-party interference.

Furthermore, if the underlying program being executed by participants' modified code changes, the resulting blockchain's design changes, allowing the development of blockchain databases capable of storing a variety of data types, such as property titles, contracts, shares, voting decisions (Noizat, 2015), and even reputation ratings. Through the development of platforms like Ethereum, Counterparty, and Block Stream 25, individuals and small businesses may now utilize blockchain-based solutions. Provenance, for example, is attempting to use the Ethereum architecture to build a very open global corporate supply chain ledger.

Experiments with smart contracts, which are small packets of code — or scripts — that can be stored on a blockchain and retrieved by users to perform simple functions, are in the fore (Wright & De Filippi, 2015). A typical insurance policy, for example, may be designed in this way (Mainelli & Von Gunten, 2014). Consider a blockchain-based script that is triggered when two parties send Bitcoins to a script-managed escrow Bitcoin account, which will subsequently release the Bitcoins to the person who wins a bet on the average amount of rainfall over a certain time in the future. This smart contract is set up to collect meteorological data from weather agencies and then release Bitcoins from escrow after a certain length of time, giving them to a farmer who is suffering from drought. This is a weather derivatives contract built on the blockchain.

Simple building-block contracts may be used to create more complex multi-stage or multi-function entities known as "decentralized autonomous organizations" (DAOs) by some. While complex multi-stage algorithms are kept in the background on a decentralized network of computers rather than being managed by a single management team, such DAOs are difficult to understand and seem to many people to be science fiction.

When it comes to collecting basic data for those with more urgent pragmatic needs, blockchain networks are often the most effective. The potential of blockchain technologies to permanently record property rights has drawn the attention of proponents of free market economics. Land registries are often used as examples. There is an issue of double registration of land, land title fraud, or unclear title to land in countries with poor governance and record-keeping systems, which may be addressed with a blockchain system that permanently records land title in a public manner. In 2015, Honduras formed a partnership with the American firm Factom 27 to create a land registry based on blockchain technology (Chavez-Dreyfuss, 2016).

Brian Singer believes that blockchain technology is the ultimate way to achieving Hernando de Soto's objective of establishing strong property rights in informal economies in an interview with *Forbes* titled "How Bitcoin Can End Global Poverty" (Forbes, 2015). Inert capital may be enabled if people are given names and property titles. The title to a home may be used to generate leverage, allowing banks to lend to informal entrepreneurs at a lower interest rate.

This paper is founded on the idea that, if property and contracts are properly protected, market and capitalization processes may help people overcome poverty by exposing the hidden potential of informal economies. Rather than relying on a politically controlled State to optimize these market processes, the poverty-eradicating power of property and markets might be enhanced by replacing inefficient state institutions with technology, which would be a kind of political "escape".

However, it is unclear if such blockchain registries can solve core issues. Uncertain land titles are frequent in areas where institutions are weak, which adds to the original ambiguity. In this situation, just providing a technology for recording claims is worthless unless there are strong legal institutions in place to accept the blockchain-registered claims, as well as strong processes in place to determine who gets to submit the claims. There is a sense of perspective here. While blockchain technology has the most promise in circumstances where institutions and parties are vulnerable and cannot simply trust one another. For example, Afghanistan, where governmental capacity is weak and confidence is poor due to war, is in the worst position to deploy such technology. 30 major banks, technology companies, and other

organizations, including J.P. Morgan Chase, Microsoft, and Intel, are collaborating to develop enterprise-ready implementations of Ethereum, a decentralized computing network based on digital currencies, because it paved the way for decentralized financing (Hackett, 2017).

6.1 Benefits of the Decentralized Blockchain Technology

6.1.1 Bitcoin's Technology Safeguards Financial Platforms from Deplatforming

The Reserve Bank of India (RBI) would govern a digital rupee, while Bitcoin and Ethereum are decentralized international cryptocurrencies that are not controlled by any one entity. Administrators of the RBI's digital rupee will be allowed to create wallets, suspend accounts, and reverse transactions. By contrast, Bitcoin is more comparable to digital gold in that it cannot be frozen or stolen by any government. This characteristic contributes significantly to Bitcoin's value in terms of maintaining India's national stability. In times of conflict, India and its diaspora will rely on a network that no government can shut down (Balaji, 2021).

6.1.2 Ethereum's Technology Prevents Social Media Sites from Being Deplatformed

India can emphasize national support for open technologies such as Ethereum in order to create social networks and chat applications that US corporations cannot shut down, for the same reasons that Mexico, Germany, and France expressed outrage over the de-platforming of a sitting US president and his supporters by a group of American tech giants. Global Twitter replacements would be part of the solution, but non-Indians would not be able to use Indian Twitter, and India would also need to interact with the rest of the world via neutral foreign channels. That is what blockchain enables. It is critical to keep in mind that the potential of political deplatforming exists. It is not a big thing to prohibit someone else once a social network prohibits the "world's most powerful man" (referring to Mr. Donald Trump's twitter account being disabled). Each day, another news confirms this tendency. Consider that millions of Indians already use American-developed applications such as Twitter, WhatsApp, Facebook, Gmail, PayPal, and Google Pay. If the Indian Prime Minister or the Indian people get enough negative publicity, American technology firms may ban them from entering the US and accessing most of the internet. Not just through telephone message, but also via payment submission and collection via US-controlled networks such as SWIFT, PayPal, and Google Pay.

America might serve as the impetus for such an occurrence. The New York Times published an erroneous photograph of a Brazilian rainforest on fire, leading an Atlantic writer to advocate for Brazil's invasion. Though the calmer heads prevailed when the photograph was revealed to be a fake, anyone could be the next victim of government misinformation (Chokshi, 2019). There is no way of knowing when digital warfare may erupt. Decentralization is incompatible with deplatforming; hence, blockchain solves the problem.

6.2 Foreign Investment: Crypto brings apital to India

People in the global technology community agree on the significance of Bitcoin. Olaf Carson-Wee of Polychain Capital projected that cryptocurrencies would create 25-50 percent of the world's millionaires if and when Bitcoin hits \$200,000 per Bitcoin. Consequently, India's alleged prohibition of Bitcoin criminalizes the belongings of many otherwise innocent Indians. In the first case, it prevents a trillion dollars' worth of cryptocurrency from being transferred to India. The planned crypto ban would increase capital movement. Additionally, neoliberal travel. Let us not overlook the fact that Indian entrepreneurs are very mobile. The value of cryptocurrency exchanges such as Coinbase, Binance, and Kraken, as well as cryptocurrency mining companies and new digital currencies such as Ethereum, has risen to billions of dollars. All Indian counterparts to such institutions will be located outside the country, as Indian pioneers are once again forced to migrate. On the other hand, the right crypto approach would result in capital landing rather than capital flight. Consider the billions of dollars' worth of cryptocurrencies expected to arrive in India. Frequently, forward-thinking technological capitals and financial centers like Switzerland and Singapore have adopted pro-crypto positions in order to attract the world's largest creators and purchasers to their borders. At the present, the US and China are on a collision path with regard to monetary effect. The US wants all nations to adopt the dollar, while China may use the Belt and Road to promote its digital yuan. India may reinvent itself as a decentralized development that promotes crypto conventions as an alternative to the principles-based global request, beginning with its monetary framework: a computerized rupee backed by advanced gold.

India has successfully recognized that re-establishing uncommitted development would play a stabilizing role in the next US-China Cold War. Additionally, digital currencies provide a scholarly method for financial adjustment across the developments of often varied nations. In contrast to US and China, who will attempt to coerce nations into accepting the dollar or advanced yuan separately, India understands that each country will ultimately need its own public money on a local level and a global one. Bitcoin and crypto conventions provide that neutral stage, a calm environment conducive to global trade and communication, just as gold did in the past and the Law of the Sea does now. In comparison to the dollar or yuan, the advanced rupee is not a candidate to become the world's reserve currency. Thus, although India may have some responsibility for the advancing rupee on a local level, it would be preferable if nobody were in charge, particularly the inevitably unpredictable US or China.

6.3 Financial Fraud Prevention: Crypto refers to mathematically provable accounting

Blockchain, according to Deloitte, is a breakthrough in accounting since it allows for triple-entry accounting. Many people are unaware that the big four accounting companies (PwC, EY, KPMG, and Deloitte) are already using Bitcoin and Ethereum as gold standards of reality. PwC's Halo, for example, "interrogates the network in an unbiased and trustworthy manner to collect verifying information on blockchain transactions and balances", according to the company. The corroborating facts may be trusted because blockchains employ cryptography to establish a visible global record of who charged what money to whom, when and how. Furthermore, if a company's internal history of Bitcoin transactions has mistaken, it may always refer the blockchain record to reconcile a payment. This triple-entry bookkeeping has been dubbed a "game-changer" in accounting by Deloitte and others as a way to "dramatically simplify accounting procedures while staying compliant with regulatory requirements". It is the most significant accounting breakthrough since the introduction of double-entry bookkeeping, which academics say paved the way for the current financial sector.

On-chain accounting makes audits both easy and automated, which is a key feature. Proof-of-reserve technology, for example, allows businesses to confirm that they have the necessary cash on hand on a regular basis. This would prevent situations like those described in the Vijay Mallya⁴ case, in which allegedly false proof of reserves was submitted to get loans. A blockchain-based lending network (such as MakerDao) will never fall for such a fraud since it requires cryptographically provable on-chain collateral. Regulators may use blockchains to replay transactions for market monitoring, assign some compliance to smart contracts, and even allow for on-chain stock certificate issuance and custody for real-time settlement. In addition, India is considering enabling technology firms to join the banking sector.

Authorities will be able to monitor and mitigate risk with the use of blockchain-based accounting. India may outperform the rest of the world by mandating on-chain accounting, invoicing, and stock issuance for all companies by 2030, thanks to the combination of India Stack and the digital currency. We can avoid manipulation, improve financial sector credibility, and attract more foreign direct investment by encrypting all financial transactions. Overseas investors will have confidence in the accounting. In a nutshell, this is a full 180-degree turn in legislative policy. In the same way that the US government attempted to prohibit encryption in the 1990s before eventually mandating it, intelligent Indian regulators should recognize that blockchains have the potential to deter financial fraud and increase trust in the mechanism through mathematical, cryptographic proofs of enforcement.

6.3.1 Banning crypto is not technically feasible

Banning Bitcoin is theoretically impossible since, even if a government bans cryptocurrencies, it cannot prohibit wallets because they are decentralized access to a wallet and can be reduced to a login ID and password. In case, an individual forgets his/her password, access to the wallet can be regained through a 12-word security key. Thus, cryptocurrency ownership can be reduced to the possession of 12 random words, which can easily be transported across international borders, as something as trivial as a handful of words cannot be regulated. Anyone can deposit Bitcoins (BTC) into your account, but only the individual who owns the wallet with the pass can withdraw them. Therefore, rendering crypto wallets is immune to third party intervention.

⁴ Businessman Vijay Mallya is an accused in a bank loan default case of over \$1.3 billion, which involved his defunct Kingfisher Airlines. <https://blog.ipleaders.in/analysis-vijay-mallya-case/>; <https://economictimes.indiatimes.com/topic/Vijay-Mallya-case>; <https://blog.ipleaders.in/analysis-vijay-mallya-case/>; <https://economictimes.indiatimes.com/topic/Vijay-Mallya-case>

7. CONCLUSION

Cryptocurrency and the blockchain technology are the next step in facilitating truly trustless exchange of value in modern civilization. The decentralization of blockchain will give rise to operating currencies that cannot be shut down without a complete agreement between nodes. Individual countries placing a ban on the technology or the currency running on it shall not be fruitful due to its decentralized nature. Decentralized open ledgers have proved to be the gold standard of accounting, embracing the technology shall only bring capital investment to the country. The currencies like Ethereum, which use smart contracts, allow users a very powerful platform to develop application on it. The benefits of using Bitcoin technology are that it protects finance platforms from being deplatformed. Whereas Ethereum's technology helps avoid the deplatforming of social media platforms. It enhances Foreign Investment that is Crypto brings capital to India. Another important benefit is Financial Fraud Prevention which could be understood by the phenomenon that Crypto refers to mathematically provable accounting. Finally, we conclude that banning Crypto is not technically feasible.

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AUTHORS' DECLARATIONS AND ESSENTIAL ETHICAL COMPLIANCES

Authors' Contributions (in accordance with ICMJE criteria for authorship)

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Collected the data	Yes	Yes
Contributed to data analysis & interpretation	Yes	No
Wrote the article/paper	Yes	No
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